

C. ADJUSTMENT PROCEDURES, ETC.

C - 1. ADJUSTMENT OF OPEN SIGNAL CONTACT POSITION

* After the Ring Plate Ass'y is replaced, adjust the position of the Open Signal Contact.

- 1) Loosen the Open F - FPC Setscrews (6601009) \times 2.
- 2) Install the Planar F1.4/50 Lens on the Body Mount.
- 3) Set the aperture of the lens to "F 1.4".
- 4) Adjust the position of the Open F - FPC so that the Open Signal Contact is positioned between the two lowest patterns on the Open F - FPC.
- 5) Tighten the Open F - FPC Setscrews.

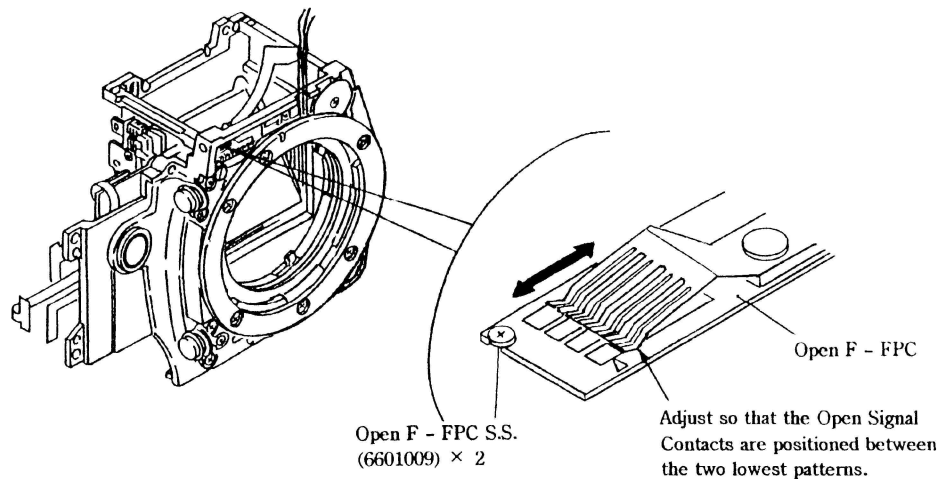


Fig. 65

C - 2. ADJUSTMENT OF PERFORATION POSITION

* Once the Winding Unit Ass'y is disassembled, adjust the position of perforations.

- 1) Turn the Frame Limiting Gear in the direction of the arrow to eliminate the play of the gear.
- 2) Install the Sprocket Gear (A) (17436910) so that the end of the groove is positioned at the center of the screw hole in the FW Upper Base Plate.
- 3) When the Sprocket Gear (A) can not be installed in the position as shown in Fig. 66, install it in the 180 - degree turned position. If the Sprocket Gear (A) can not be installed even in the 180 - degree turned position, replace and install the Sprocket Gear (17437010). If even the Sprocket Gear can not be installed in the position as shown in Fig. 66, install it in the 180 - degree Qturned position.
- 4) After installing the Sprocket Gear (A) or Sprocket Gear in the correct position, install the Sprocket Gear Holder (1AM35120) and tighten the Sprocket Gear Holder Setscrews (61901826) \times 2.
- 5) Install the Winding Unit Ass'y (1AMB1700) in the Body and tighten the Winding Unit Ass'y Setscrews (61813026) \times 2, (61913522). (See Fig. 24)
- 6) Perform the checking of perforation position.

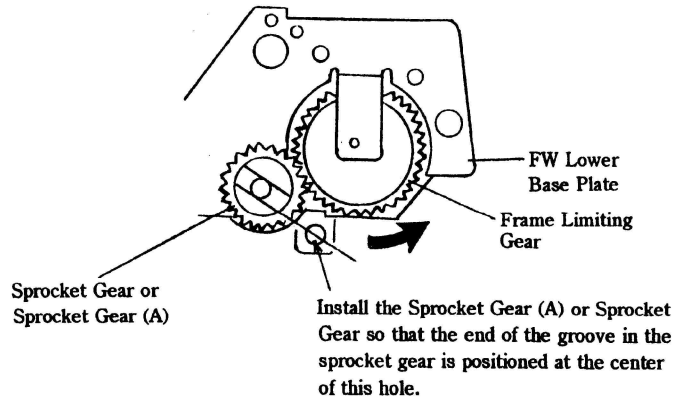
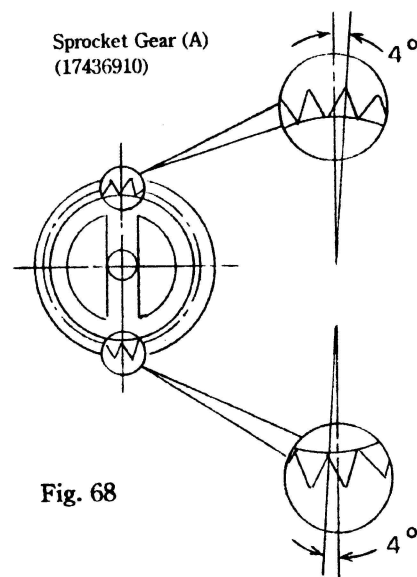
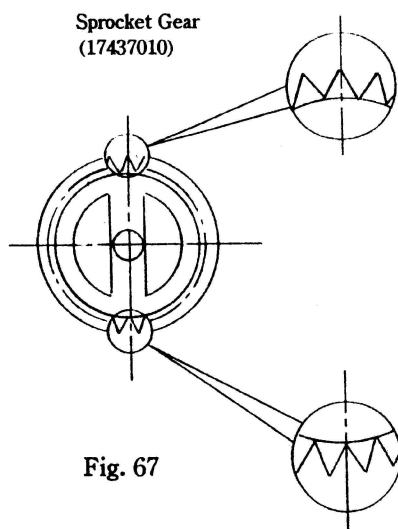


Fig. 66

- * Make the adjustment of perforation position by selecting one of the four ways, using the two sprocket gears, namely, the Sprocket Gear and the Sprocket Gear (A).
- * Do not install the Winding Unit Ass'y in the Body with the Sprocket Gear or Sprocket Gear (A) dislocated; otherwise, the perforations will not be positioned properly.

(Distinction between Sprocket Gear and Sprocket Gear (A))



[Checking of Perforation Position]

* Put a film (non - exposed and developed Black & White film) on the Sprocket and check the position of a perforation relative to the image plane frame.

Make certain that the edge of the image plane frame is positioned 0.2 ~ 0.3mm away to the right from a perforation in the film.

Adjustment Procedure

- ① Engage film perforations with Sprocket teeth.
- ② Curl the film slightly by pressing its right side gently with your fingers.
- ③ Pull the left side of the film gently in the direction of the arrow.
- ④ Make certain that the edge of the image plane frame is positioned 0.2 ~ 0.3mm away to the right from a perforation in the film.
- ⑤ If the perforation position is not proper, make the adjustment of C - 2 again.

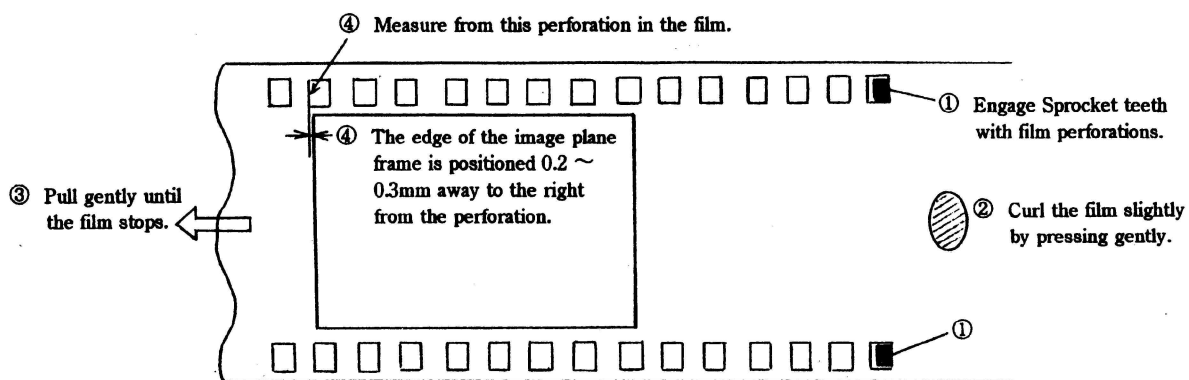


Fig. 69

C - 3. ADJUSTMENT OF VIEWFINDER INDICATION POSITIONS

* Place your eye at the center of the eyepiece lens and make adjustment so that all the indications (film counter, metering display, exposure compensation indication, flash mark, Digital Focus Indicator, aperture display, exposure mark and shutter speed indicator) can be seen without vignetting.

- 1) Remove the Dioptic Adjuster Ass'y Setscrews (63914026) \times 2 and take off the Dioptic Adjuster Ass'y (1AMF0500). (See Fig. 31)
- 2) Loosen the Finder LCD Ass'y Setscrews (63902226) \times 2.
- 3) Set the voltage of the regulated DC power supply to about 5.17V.
- 4) Connect the (+) terminal of the regulated DC power supply to the Orange lead wire of the Finder LCD and the (-) terminal to the Green lead wire.
- 5) Install the Dioptic Adjuster Ass'y temporarily.
- 6) Turn on the switch of the regulated DC power supply.
- 7) Look in the viewfinder through the eyepiece lens and adjust the position of the Finder LCD Ass'y by moving it.
- 8) Remove the Dioptic Adjuster Ass'y and tighten the Finder LCD Ass'y Setscrews.
Lock the Finder LCD Ass'y Setscrews by applying the bond (Cemedine 551) to their heads.
- 9) Install the Dioptic Adjuster Ass'y and tighten the Dioptic Adjuster Setscrews.

(Viewfinder Display)

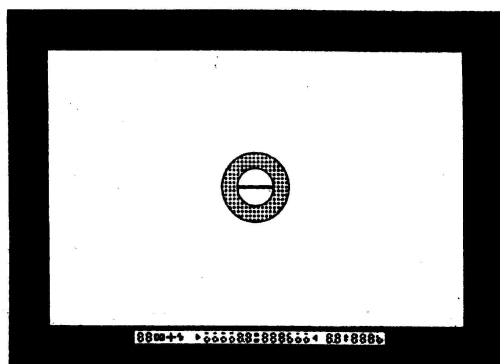


Fig. 70

(Rear View of Mirror Box Ass'y)

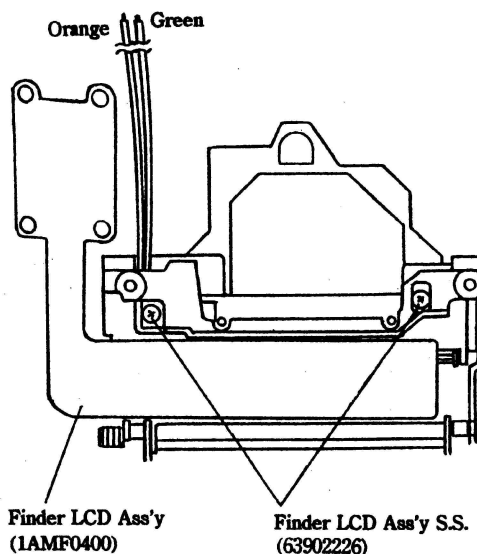


Fig. 71

C - 4. ADJUSTMENT OF SPOT LIGHT METERING POSITION

- * Adjust the position of the light metering sensor (SPD) for correct spot light metering.
- * After the Dioptic Adjuster Ass'y or the Light Metering FPC is replaced, be sure to make this adjustment of spot light metering position.

(Adjusting Tools)

- EF - 500 or EF - 8000 AE Tester
- Planar F1.4/50 Lens
- Black Chart (to be prepared)

(Preparation of Chart)

- Prepare a chart of about 40mm × 90mm of low - reflectivity black paper.

(Preparation of Chart)

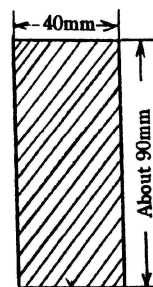


Fig. 72

Black paper of low reflectivity

Adjustment Procedure

- 1) Loosen the Accessory Shoe Base Setscrews (69214076) × 2 slightly.
- 2) Install the Top Cover Ass'y temporarily.
- 3) Set the Planar F1.4/50 Lens on the camera.
- 4) Set the exposure mode to "Av".
- 5) Set the Metering Mode Selector Lever to the spot metering mark " ".
Turn on the Main Switch.
- 6) Fix the black chart vertically to the light source surface of the AE Tester (EF - 500 or EF - 8000) with Scotch tape.
- 7) Set the brightness of the AE Tester to "LV15".

(Top View of Dioptic Adjuster Ass'y)

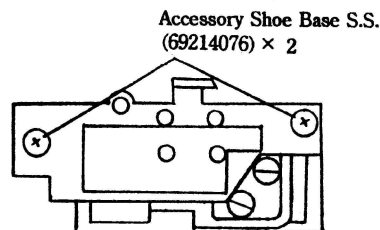


Fig. 73

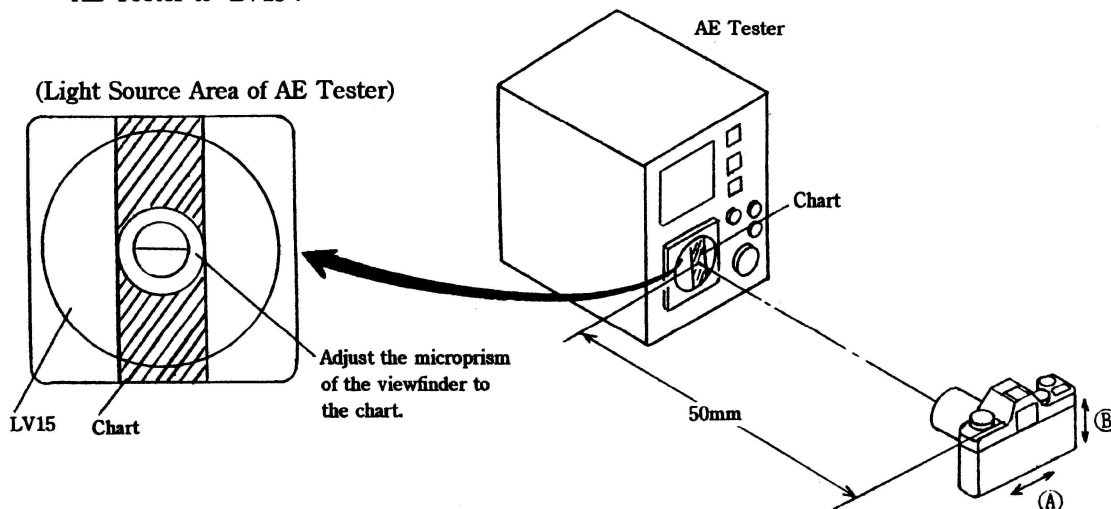


Fig. 74

- 8) Set the camera at 50cm from the black chart and focus the lens. At this time, adjust the microprism area (about ϕ 5mm) of the viewfinder to the side lines of the black chart rectangle.
- 9) Look into the viewfinder and swing the camera gently right and left (in the direction of the arrow (A)). (See Fig. 74)

And adjust by turning the Adjusting Screw (a) so that the shutter speed indicator shows the slowest speed.

* Remove the Top Cover Ass'y for this adjustment.

- 10) Repeat 8) and 9).
- 11) Remove the black chart and fix it with the long side of the rectangle in the horizontal position.
- 12) Set the camera at 50cm from the black chart and focus the lens. At this time, adjust the microprism area (about ϕ 5mm) of the viewfinder to the side lines of the black chart rectangle.
- 13) Look into the viewfinder and swing the camera gently up and down (in the direction of the arrow (B)). (See Fig. 74)
- And adjust by turning the Adjusting Screw (b) so that the shutter speed indicator shows the slowest speed. (See Fig. 74)
- 14) Repeat 12) and 13).
- 15) Tighten up the Accessory Shoe Base Setscrews (69214076) \times 2.
- 16) Lock the Adjusting Screws with the bond (Cemedine 551) as shown in Fig. 75.

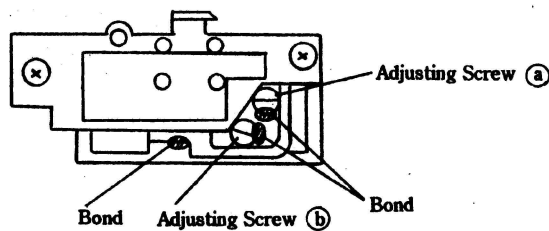


Fig. 75

C - 5. ADJUSTMENT OF FLANGE BACK

- ① Distance from the Body Mount surface to the film rail surface:

45.43 ± 0.02 mm

For the adjustment, insert appropriate washers between the Body Mount and the Mirror Box.

Adjusting washers: 0.05 mm (12866600), 0.02 mm (12866700)

- ② Level difference between the film rail surface and the pressure plate rail surface:

0.20 ± 0.02 mm

C - 6. ADJUSTMENT OF VIEWFINDER FOCUSING

- ① If focusing is not achieved even when the focus ring of the Lens is turned to the infinity position

The finder back is too long, so shorten (lower) the position of the focusing plate.

- ② If focusing occurs before the focus ring of the Lens is turned to the infinity position

The finder back is too short, so lengthen (raise) the position of the focusing plate.

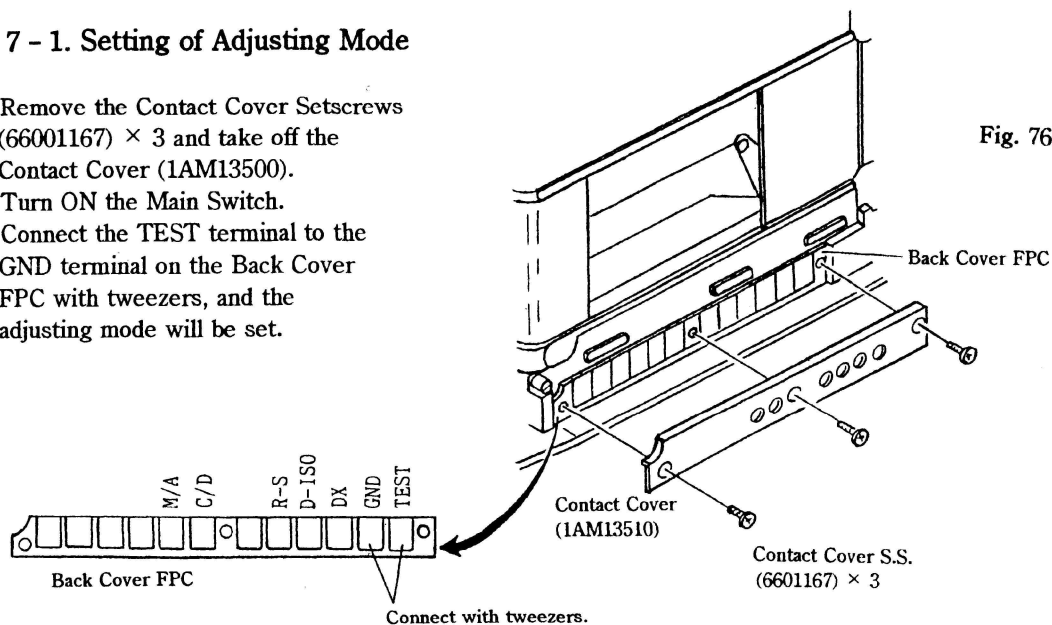
For the adjustment, replace the washer under the Penta Holder. (See Fig.31)

C - 7. ADJUSTMENT OF COMPENSATION VALUES

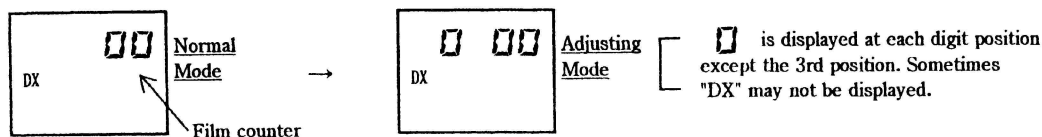
This camera permits the adjustments of compensation values (adjusted values) only by its manual operation. Therefore, adjustments can be made without communication with any special adjusting tools.

C - 7 - 1. Setting of Adjusting Mode

- 1) Remove the Contact Cover Setscrews (66001167) \times 3 and take off the Contact Cover (1AM13500).
- 2) Turn ON the Main Switch.
- 3) Connect the TEST terminal to the GND terminal on the Back Cover FPC with tweezers, and the adjusting mode will be set.



- 4) At transition to adjusting mode, the display on the External LCD Panel changes as follows:

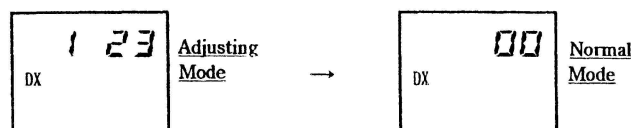


Notes:

- a) Perform the setting of adjusting mode with the Main Switch turned ON.
- b) Once adjusting mode is set, you may remove the tweezers.
- c) The viewfinder display maintains the same status as that before the transition to adjusting mode. Therefore, the viewfinder display does not light up when the adjusting mode is set from the power OFF state.

[Cancellation of Adjusting Mode]

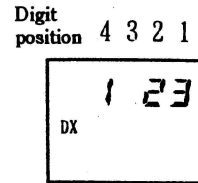
The normal mode can be restored by turning OFF the Main Switch or removing the battery. At this point, the display on the External LCD Panel changes as follows:



C - 7 - 2. Display, Change and Storage of Adjusted Values

(1) Display of Adjusted Value

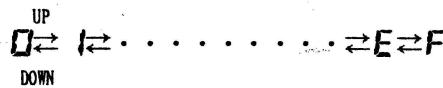
- ① 4th digit: Indicates the adjustment item number. The hexadecimal numbers of 0 ~ F represent 16 adjustment items.
☆ Initial display: " 0 "
- ② 3rd digit: Indicates the plus or minus sign of the number indicated at the 1st and 2nd digit positions. However, the plus is represented by a blank and the minus is represented by "-".
☆ Initial display: " " (blank)
- ③ 1st and 2nd digits: Indicates the adjusted value of the selected adjustment item. Adjusted values are represented by decimal numbers ranging from - 99 to 99 .
☆ Initial display: " 00 "



(2) Change

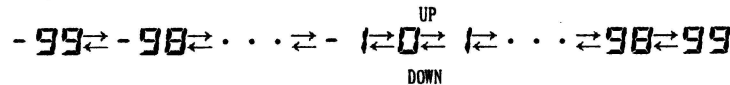
① Change of adjustment item number:

While pressing the Exposure Check Switch, press the UP Button to increment the item number or press the DOWN Button to decrement it. One press will change the number by one. However, press of the DOWN Button with " 0 " displayed or press of the UP Button with " F " displayed will not change the number.



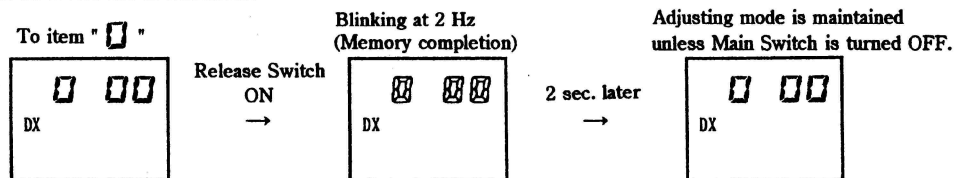
② Change of adjusted value:

Change the adjusted value of the adjustment item selected in ① . The value adjusted previously is displayed first. Then adjust the value (initial value is " 00 "). Press the UP Button to increment the value or press the DOWN Button to decrement it. One press of the button will change the value by one. The upper limit and lower limit of the value vary with the adjustment items. In the widest, you can not change the value by pressing the DOWN Button at "- 99" or the UP Button at " 99". Keep pressing the UP or DOWN Button (for more than 1.2 sec.), and the value will be changed as rapidly as at four times a second.



(3) Storage of Adjusted Value

Return the item number to " 0 " and turn ON the Release Switch, and the adjusted value of each adjustment item will be written in EEPROM, whether the adjusted value has been changed or not. That is, the item " 0 " means memory mode, where the display at the adjusted value position always becomes " 00 " (The UP and DOWN Buttons do not work). At the turning - ON of the Release Switch, the display blinks at 2 Hz for 2 seconds.



(4) Change of Adjusting Mode

There are three adjusting modes, which can be switched by means of the A.B.C Lever.

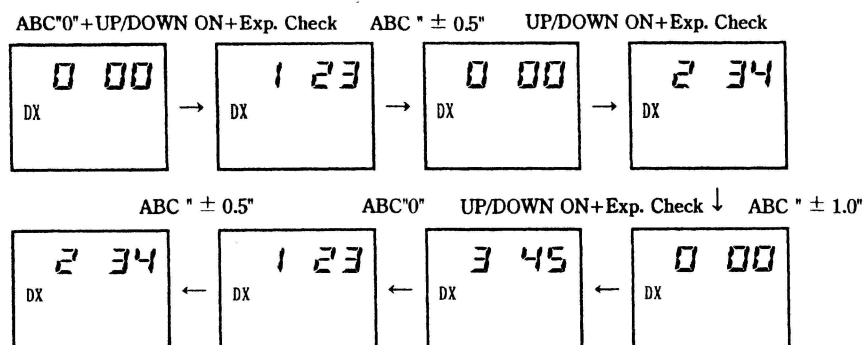
Table 1 Change of Adjusting Mode

Setting position of A.B.C. Lever	Mode
0	Output adjustment
± 0.5	Input adjustment
± 1.0	Semiautomatic adjustment/display

Notes

At the beginning of adjusting mode, the item number " 0 " is displayed in each adjusting mode even by changing the A.B.C. Lever setting only. And the item numbers in each mode are closed within each mode. Therefore, the adjusted values in each mode are written in EEPROM by turning ON the Release Switch with the item number of the mode returned to " 0 ".

※ The display changes as shown below by changing the A.B.C. Lever position. However, return the item number to " 0 " and turn ON the Release Switch to leave each mode; otherwise, the adjusted values in the mode will remain as before.



C - 7 - 3. Description of Adjustment Items

Table 2 describes the adjustment items in the each modes.

[Complementary Notes]

- ☆ In the spare area, " 00 " is displayed at the adjusted value position even by changing the item number. That is, the operation at the adjusted value position is not possible (UP/DOWN operation is possible as long as the Exposure Check Switch is turned ON.)
- ☆ Never change any data of the adjustment items other than specified for use in repair.

☆ Notes on output adjustment mode

For the adjustment items 1 ~ 7, the release sequence is executed by turning ON the Release Switch. At this time, however, the battery check is not performed. Therefore, pay attention to the voltage of the battery.

☆ Notes on semiautomatic adjustment/display mode

- The items of 1 ~ 3 are semiautomatic adjustment items and 4 ~ 6 are display items. The data of 4 and 7 ~ 6 are indicated hexadecimally.
- The data of the adjustment items 4 ~ 7 only can be written at the item 0.

Table 2 Adjustment Items

Mode	Item No.	Adjustment item	Resolution	Range of indications (adjusted values)
Output adjust - ment	0	Writing	—	00 → (0 00 blinking)
	1	Shutter time	8 μ s	-30~ 16 (-30*8 ~ 16*8 μ s)
	2	Aperture delay pulse	1/16Av (1 pulse)	-20~ 20 (-20 ~ 20 pulses)
	3	TTL Flash Auto control value	1/3Ev	-03~ 03 (-3/3 ~ 3/3Ev)
	4	Reference value for average metering light exposure	1/8Lv	- 16~ 16 (-16/8 ~ 16/8Lv)
	5	Average metering inclination	2 ⁻⁷ =0.0078	-99~ 99 (-0.773 ~ 0.773)
	6	Reference value for spot metering light exposure	1/8Lv	- 16~ 16 (-0.773 ~ 0.773)
	7	Spot metering inclination	2 ⁻⁷ =0.0078	-99~ 99 (-16/8 ~ 16/8Lv)
	8	Battery check B1	28.67mv	-35~ 35 (B1-1.003 ~ B1+1.003v)
	9	Battery check B2	28.67mv	-35~ 35 (B2-1.003 ~ B2+1.003v)
	F	AF	1/128 pitch	-99~ 99 (-99/128 ~ 99/128 pitch)
	b c	□ Not used by serviceside. Never change the data, however.		
	d	Boundary value of Focus Indicator	3.9 μ m	-99~ 99 (-386.1 ~ 386.1 μ m)
	f	□ Spare	—	00
Input adjust - ment	0	Writing	—	00 → (0 00 blinking)
	1	Reference value for exposure compensation resistance	1/48Ev	-50~ 50 (-50/48 ~ 50/48Ev)
	2	Inclination of exposure compensation resistance	2 ⁻⁵ =0.031	-65~ 65
	3	Reference value for aperture resistance	1/24Av	-50~ 50 (-50/24 ~ 50/24Av)
	4	Inclination of aperture resistance	2 ⁻⁵ =0.031	-97~ 97
	5	Reference value for shutter resistance	1/16Tv	-50~ 50 (-50/16 ~ 50/16Tv)
	6	Inclination of shutter resistance	2 ⁻⁵ =0.031	-65~ 65
	7	□ Spare	—	00

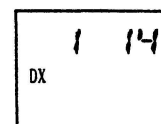
ABC ± 1.0 Semi - automa tic adjust - ment /display	0	Writing	—	00 → (0 00 blinking)
	1	Semiautomatic adjustment of aperture resistance	—	(14→ 16→ 1 11 blinking/ E EE blinking)
	2	Semiautomatic adjustment of shutter resistance	—	(40→ 41→ 2 22 blinking/ E EE blinking)
	3	Semiautomatic adjustment of exposure compensation resistance	—	(-02→ 02→ 3 33 blinking/ E EE blinking)
	4	Error code display	—	See Table 4.
	5	Cumulative counter value	1024 shots	00~ 99 (0 ~ 101, 376 shots)
	6	Cumulative counter value (H)	256 shots	00~ 03 (0 ~ 1, 023 shots)
	7	Cumulative counter value (L)	1 shot	00~ FF (0 ~ 255 shots)
	8 9 A	<div style="border: 1px solid black; width: 20px; height: 20px; display: inline-block; vertical-align: middle;"></div> Not used by serviceside. Special indications are performed.		
	b	De - focus amount (integer part)	1mm	00~ FF (-128 ~ 127mm)
	c	De - focus amount (decimal part)	3.9 μ m	00~ FF (0 ~ 996 μ m)
	d	All viewfinder indications lighting	—	00 → (d dd blinking)
	E	Not used by serviceside. Never press Shutter Release; otherwise, data will be destroyed.		
	F	Spare	—	00

C - 7 - 4. Adjustment Procedure

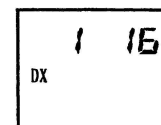
(1) Adjustment of Aperture Resistance

* Perform the following operations with the standard lens of 50mm/f1.4 (Planar) mounted on the camera:

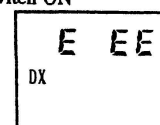
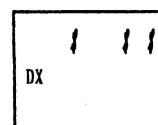
- ① After transition to adjusting mode, set the A.B.C. Lever in the " ± 1.0 " position and select the item number by pressing UP or DOWN Button while turning ON the Exposure Check Switch. (Display is as shown at upper right.)
- ② At this point, set the Aperture Ring of Lens to F1.4 and turn ON the Release Switch. (Display is as shown at center right.)
- ③ Then set the Aperture Ring of Lens to F16 and turn ON the Release Switch. (Display is as shown at lower right.)



↓ Release Switch ON



OK ↙ NG ↘
Release Switch ON



1 11 blinks (at 2 Hz for 2 sec.) when the adjusted value is within the allowable range.
E EE blinks (at 2 Hz for 4 sec.) when the adjusted value is out of the allowable range.

After that, the display will return to that as shown at upper right.

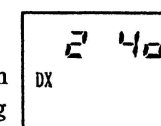
Through the operations of ①~③, the reference value for aperture resistance and the inclination of aperture resistance are calculated in the camera and the adjusted values are written. (There is no need of returning the item number to 0.)

- ④ The adjusted values can be checked by setting the adjustment items " 3 " and " 4 " with the A.B.C. Lever set in the " ± 0.5 " position. Also the adjusted values can be written directly. In this case, any of the values up to ± 50 can be input as the reference value. However, the input value must be limited to within the range of ± 06 to meet the specification.

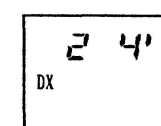
※ Inclination --- When the A/D value changes by 6 for every $1/4 A_v$, a change in the adjusted value by ± 1 causes a change in the A/D value by 6 ± 0.031 .

(2) Adjustment of Shutter Resistance

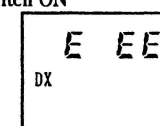
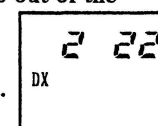
- ① After transition to adjusting mode, set the A.B.C. Lever in the " ± 1.0 " position and select the item number 2 by pressing UP or DOWN Button while turning ON the Exposure Check Switch. (Display is as shown at upper right.)
- ② At this point, set the Shutter Dial to 1/4000 and turn ON the Release Switch. (Display is as shown at center right.)
- ③ Then set the Shutter Dial to 4" and turn ON the Release Switch. (Display is as shown at lower right.)



↓ Release Switch ON



OK ↙ NG ↘
Release Switch ON



2 22 blinks (at 2 Hz for 2 sec.) when the adjusted value is within the allowable range.
E EE blinks (at 2 Hz for 4 sec.) when the adjusted value is out of the allowable range.

After that, the display will return to that as shown at upper right.

Through the operations of ①~③, the reference value for shutter resistance and the inclination of shutter resistance are calculated in the camera and the adjusted values are written. (There is no need of returning the item number to 0.)

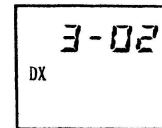
- ④ The adjusted values can be checked by setting the adjustment items "5" and "6" with the A.B.C. Lever set in the "± 0.5" position. Also the adjusted values can be written directly. In this case, any of the values up to ± 50 can be input as the reference value. However, the input value must be limited to within the range of ± 08 to meet the specification.

※ Inclination --- When the A/D value changes by 4 for every 1/4 Tv, a change in the adjusted value by ± 1 causes a change in the A/D value by 4 ± 0.031 .

(3) Adjustment of Exposure Compensation Resistance

- ① After transition to adjusting mode, set the A.B.C. Lever in the "± 1.0" position and select the item number 3 by pressing UP or DOWN Button while turning ON the Exposure Check Switch.

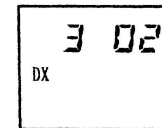
(Display is as shown at upper right.)



- ② At this point, set the Exp. Compensation Dial to -2.0 and turn ON the Release Switch. (Display is as shown at center right.)

↓ Release Switch ON

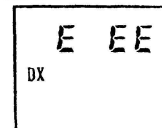
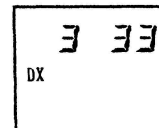
- ③ Then set the Exp. Compensation Dial to +2.0 and turn ON the Release Switch. (Display is as shown at lower right.)



3 33 blinks (at 2 Hz for 2 sec.) when the adjusted value is within the allowable range.

E EE blinks (at 2 Hz for 4 sec.) when the adjusted value is out of the allowable range.

OK NG
Release Switch ON



After that, the display will return to that as shown at upper right.

Through the operations of ①~③, the reference value for exp. compensation resistance and the inclination of exp. compensation resistance are calculated in the camera and the adjusted values are written.

(There is no need of returning the item number to 0.)

- ④ The adjusted values can be checked by setting the adjustment items "1" and "2" with the A.B.C. Lever set in the "± 0.5" position. Also the adjusted values can be written directly. In this case, any of the values up to ± 50 can be input as the reference value. However, the input value must be limited to within the range of ± 16 to meet the specification.

※ Inclination --- When the A/D value changes by 4 for every 1/12 Ev, a change in the adjusted value by ± 1 causes a change in the A/D value by 4 ± 0.031 .

(4) Adjustment of Shutter Time

* Before this adjustment, make the adjustment of the Shutter Resistance.


- ① Set the camera on the shutter tester with the Back Cover open.
- ② Set the Exposure Mode Dial to "M" and the Shutter Dial to "1/4000".
- ③ After transition to adjusting mode, set the A.B.C. Lever in the "0" position and select the item number "1" by pressing UP or DOWN Button while turning ON the Exposure Check Switch.
- ④ Turn ON the Release Switch to execute the release sequence and change the adjusted value according to the time Tm displayed on the shutter tester, by pressing UP or DOWN Button.

□ Tm: slow → Press DOWN Button (to - 30 max.)
Tm: fast → Press UP Button (to 16 max.)

At this point, determine the adjusted value based on 1/4000 sec. (244 μs) and employ the value calculated from the following formula for use with all the shutter speeds. However, do not add the adjusted value for any shutter speed of 1/8 second and larger.

$$\text{Adjusted value} = \text{INT} \{ (244 \mu\text{s} - \text{Shutter speed}) / 8 \mu\text{s} \}$$

※ The allowable range of shutter time is shown in below.

- ⑤ After the change of the adjusted value, return the item to "  " and turn ON the Release Switch to store the new adjusted value.
- ⑥ Restore the normal mode by turning OFF the Main Switch and make certain that the result of the adjustment is proper, using the shutter tester.

(Allowable Range of Manual Exposure Time)

Shutter speed	+	Reference value	-	Tolerance
X	8.37	7.81	7.29	± 0.10EV
1 "	1035	1000	966	± 0.05EV
1/2	517.6	500	483.0	
1/4	258.8	250	241.5	
1/8	134.0	125	116.6	
1/15	66.99	62.50	58.32	± 0.10EV
1/30	33.55	31.30	29.20	
1/60	16.75	15.63	14.58	
1/125	8.37	7.81	7.29	
1/250	4.81	3.91	3.17	± 0.30EV
1/500	2.40	1.95	1.58	
1/1000	1.21	0.98	0.80	
1/2000	0.647	0.49	0.371	
1/4000	0.383	0.244	0.155	± 0.65EV

* A parallel light source shutter tester is used.

(Unit: ms)

(5) Adjustment of Light Exposure


- * Before the adjustment of light exposure, be sure to make the adjustment of shutter time. Adjust the light exposure at average metering and that at spot metering the same way, since there is no difference in the range of adjusted values and resolution between them.


(5) - 1 Adjustment of reference value for light exposure

- ① Mount the 50mm, F1.4 Standard Lens (MM) on the camera and set the camera on the light exposure tester with the Back Cover open.
- ② Set the Exposure Mode Dial to "Av", the aperture to F5.6 and the light exposure tester to Lv15.
- ③ After transition to adjusting mode, set the A.B.C. Lever in the "0" position and select the item number " 4 " for average metering or " 5 " for spot metering by pressing UP or DOWN Button while turning ON the Exposure Check Switch.

※ At this point, the ISO is fixed to "100" and the light metering type is automatically determined at the setting of the item number above, irrespective of the Lever position.

- ④ Turn ON the Release Switch to execute the release sequence and change the adjusted value according to the light exposure variance Δ Ev displayed on the light exposure tester, by pressing UP or DOWN Button.

 Δ Ev: plus → Press DOWN Button (to - 16 max.)
 Δ Ev: minus → Press UP Button (to 16 max.)

- ⑤ After the change of the adjusted value, return the item to "  " and turn ON the Release Switch to store the new adjusted value.
- ⑥ Restore the normal mode by turning OFF the Main Switch and make certain that the result of the adjustment is proper, using the light exposure tester.

(5) - 2 Adjustment of inclination of light exposure

- ① Mount the 50mm, F1.4 Standard Lens (MM) on the camera and set the camera on the light exposure tester with the Back Cover open.
- ② Set the Exposure Mode Dial to "Av", the aperture to F5.6 and the light exposure tester to Lv9.
- ③ After transition to adjusting mode, set the A.B.C. Lever in the "0" position and select the item number " 5 " for average metering or " 7 " for spot metering by pressing UP or DOWN Button while turning ON the Exposure Check Switch.

※ At this point, the ISO is fixed to "100" and the light metering type is automatically determined at the setting of the item number above, irrespective of the Lever position.

- ④ Turn ON the Release Switch to execute the release sequence and change the adjusted value according to the light exposure variance Δ Ev displayed on the light exposure tester, by pressing UP or DOWN Button.

□ Δ Ev: minus → Press DOWN Button (to - 99 max.)
 □ Δ Ev: plus → Press UP Button (to 99 max.)

- ⑤ After the change of the adjusted value, return the item to " 0 " and turn ON the Release Switch to store the new adjusted value.
- ⑥ Restore the normal mode by turning OFF the Main Switch and make certain that the result of the adjustment is proper, using the light exposure tester.

※ To simplify the procedure above, you may change the Lv value of the light exposure tester according to the adjustment items 4 ~ 7 of ①~④, input each adjusted value while consulting the Δ Ev and write all the adjusted values together by ⑤.

Allowable Range of Light Exposure Values

Brightness (LV)	Allowable range
9 (8)	-0.5 ~ +0.5EV
12	-0.5 ~ +0.5EV
15	-0.5 ~ +0.5EV

ISO : 100
K value: 1.04

(6) Adjustment of Aperture Delay Pulse

* Before this adjustment, be sure to make the adjustment of light exposure.

- ① Mount the 50mm, F1.4 Standard Lens (MM) on the camera and set the camera on the light exposure tester with the Back Cover open.
- ② Set the Exposure Mode Dial to "P", the aperture to F16 and the light exposure tester to Lv12.
- ③ After transition to adjusting mode, set the A.B.C. Lever in the "0" position and select the item number " 2 " by pressing UP or DOWN Button while turning ON the Exposure Check Switch.

※ At this point, the ISO is fixed to "100".

- ④ Turn ON the Release Switch to execute the release sequence and change the adjusted value according to the light exposure variance Δ Ev displayed on the light exposure tester, by pressing UP or DOWN Button.

□ Δ Ev: plus → Press UP Button (to 20, though setting to 06 possible.)
 □ Δ Ev: minus → Press DOWN Button (to - 20, though setting to - 06 possible.)

- ⑤ After the change of the adjusted value, return the item to " 0 " and turn ON the Release Switch to store the new adjusted value.
- ⑥ Restore the normal mode by turning OFF the Main Switch and make certain that the result of the adjustment is proper, using the light exposure tester.

※ Light exposure error: In each mode (Av, P or Tv), the light exposure error at average metering, spot metering and AE - L must be 0.3Ev or less.

(7) Adjustment of TTL Flash Auto Control Value

* Make this adjustment under conditions without external light.

- ① Install the 50mm, F1.4 Standard Lens (MM), the TLA Flash Unit and the Standard Pressure Plate (Ektachrome 64 film) on the camera.
- ② Set the Exposure Mode Dial to "X" and the aperture to F5.6 and set a standard reflector with a reflectivity of 18% at 2 m from the film plane.
- ③ After transition to adjusting mode, set the A.B.C. Lever in the "0" position and select the item number " 3 " by pressing UP or DOWN Button while turning ON the Exposure Check Switch.
 ※ At this point, the ISO is fixed to "100" and exposure compensation is zero.
- ④ Turn ON the Release Switch to execute the release sequence, measure the flash light with a flash meter and change the adjusted value so that ΔEv comes within $\pm 0.6Ev$, by pressing UP or DOWN Button while turning ON the Exposure Check Switch.

□ ΔEv : plus → Press UP Button (to 0.3 max.)
 □ ΔEv : minus → Press DOWN Button (to - 0.3 max.)

- ⑤ After the change of the adjusted value, return the item to " 0 " and turn ON the Release Switch to store the new adjusted value.
- ⑥ Restore the normal mode by turning OFF the Main Switch and make certain that the result of the adjustment is proper, using the flash meter.

(Reference)

Flash Auto control time: 450 μs ~ 700 μs

AE Camera Tester: LV12

Check with Standard Pressure Plate

ISO: 100

K: 1.04

F5.6 full aperture lens

(8) Adjustment of Battery Check Level

* Adjusted values are used for two battery check levels, namely, B1 level (warning) and B2 level (operation stop).

- ① After transition to adjusting mode, set the A.B.C. Lever in the "0" position and select the item number " B " for B1 level or " S " B2 level by pressing UP or DOWN Button while turning ON the Exposure Check Switch.
- ② At the shipment from the factory, the adjusted values for battery check levels are so set that B1 level is 3.8V and B2 level 3.5V. Each of B1 and B2 levels changes by 28.67mV as the adjusted value changes by ± 1 . The battery check levels can be adjusted in the range of $\pm 1.003V$.

□ To set a lower level → Press DOWN Button (to - 35 max.)
 □ To set a higher level → Press UP Button (to 35 max.)

- ③ After the change of the adjusted value, return the item to " 0 " and turn ON the Release Switch to store the new adjusted value.

(9) Adjustment of AF

* Make the camera perform distance metering actually and calculate the difference between the actual PE value and the designed PE value. And use the difference as the AF compensation value in the subsequent AF operations by adding or subtracting it to determine the normal AF data.

- ① On the camera locked on a tripod, mount the 50/1.4 Standard Lens with its Focusing Ring fixed to "2m".
- ② Place a target chart at 2m from the camera and adjust the brightness to LV12.
- ③ After transition to adjusting mode, set the A.B.C. Lever in the "0" position. Then select the item "b" or "c" by pressing UP or DOWN Button while turning ON the Exposure Check Switch.
- ④ Turn ON the Release Switch to execute distance metering and read the value displayed on the LCD.

On the display, the difference from the designed PE value is indicated as follows:

Item "b": de - focus amount (integer part) 00 ~ FF (-128 ~ 127mm)
 Item "c": de - focus amount (decimal part) 00 ~ FF (0 ~ 996 μm)

If b = 80 or c = 00, however, distance metering is impossible. In such a case, repeat ④. If impossible distance metering is repeated, replace the target chart with another one for easy focusing.

- ⑤ The designed distance between in - focus points is 79.117 pitches. That is, the value displayed at ④ represents the difference from the designed distance between in - focus points.
- ⑥ The data (unit: [mm]) on "b" or "c" displayed at ④ is divided by the de - focus sensitivity and the resultant value (unit: [pitches]) is subtracted from the current compensation value (the value displayed at item A with the A.B.C. Lever in the "0" position) to determine the new AF compensation value.

De - focus sensitivity = 0.402010 [mm/pitch]

*** How to write compensation value

- ① After transition to adjusting mode, set the A.B.C. Lever in the "0" position and select the item number "A" by pressing UP or DOWN Button while turning ON the Exposure Check Switch.
- ② Add the difference from the designed distance between in - focus points calculated above to the value at A. If the resultant value is not within the range of -99 ~ 99 (-99/128 ~ 99/128 pitch), the adjustment must be considered impossible.
- ③ When the value is within the adjustable range, write the new AF compensation value in item "A" by pressing the UP or DOWN Button.
- ④ Select the item number "0" by pressing UP or DOWN Button while turning ON the Exposure Check Switch.
- ⑤ Turn ON the Release Switch, and the new AF compensation value will be written in EEPROM.
- ⑥ Including confirmation, repeat the adjustment several times to determine the AF compensation value properly.

(10) Adjustment of Indicator

* It is possible to shift the focus indication in the viewfinder from the actual focus position detected by the AF Sensor. This function can be used to compensate for the differences in the sharpest focus position between lenses.

- ① After transition to adjusting mode, set the A.B.C. Lever in the "0" position and select the item number "d" by pressing the UP or DOWN Button while turning ON the Exposure Check Switch.
- ② By pressing the UP or DOWN Button, input a value to shift the focus indication in the desired direction as follows:

To infinity ---> 000 ■ 00 ~ 99 (0 ~ 386.1 [μm])
 To close point ---> ■ 000 00 ~ -99 (0 ~ 386.1 [μm])

* The adjusted value must be within the range of 99 ~ -99 and the resolution is 3.9 [μm]. If the adjusted value is not within this range, the adjustment must be considered impossible.

- ③ Select the item number " **0** " by pressing UP or DOWN Button while turning ON the Exposure Check Switch. And turn ON the Release Switch to write the new adjusted value in EEPROM.
- ④ Operate the camera normally and make certain that the indication is proper (check the difference between the split image positions and the focus indication in the Indicator).

(11) Display of Error Code

* The displayed error code represents the last error which occurred actually. Once the error is corrected by repair, write **00** by the following procedure.

- ① After transition to adjusting mode, set the A.B.C. Lever in the " ± 1 " position and select the item number " **4** " by pressing UP or DOWN Button while turning ON the Exposure Check Switch. Then one of error codes shown in Table 4 will be displayed at the adjusted value display position.
- ※ The error code corresponding to a blank at Error will not be displayed.

Table 4 Error Code Table

Error Code	Error	Error Code	Error
00	No error (initial state)	10	B2 error (no - load battery check)
01		11	B2 error (initial)
02	Winding Timing Switch error	12	B2 error (winding)
03	Mirror - up control error	13	B2 error (mirror - up)
04	Mirror - down control error	14	B2 error (rewind)
05	Aperture control error	15	B2 error (blank shots advance)
06	Blank shots advance perforation error	16	B2 error (Bulb operation)
07	Blank shots advance Timing Switch error	17	
08	Frame Limiting Switch release error	18	
09		19	
0a		1a	
0b		1b	
0c		1c	
0d	AF accumulation start error	1d	Inter - CPU communication error
0e	AF accumulation end error	1e	
0f	AF data transfer error	1f	Flash communication error

- ② Upon successful completion of repair, set **00** at the adjusted value display position by pressing the UP or DOWN Button.
- ③ Select the item number " **0** " by pressing UP or DOWN Button while turning ON the Exposure Check Switch. And turn ON the Release Switch to write the **00** in EEPROM.

(12) Display of Cumulative Counter

* The Cumulative Counter automatically writes the number of shutter releases.

When the Shutter has been replaced with a new one, be sure to set the Cumulative Counter to **00** by the following procedure.

- ① After transition to adjusting mode, set the A.B.C. Lever in the " ± 1 " position and select the item numbers " **5** ", " **6** " and " **7** " by pressing UP or DOWN Button while turning ON the Exposure Check Switch. Then the number of shots will be displayed at the adjusted value display position as follows:

Item 5	-----> Count taken every 1024 shots (to 99 max.)
Item 6	-----> Count taken every 256 shots (to 03 max.)
Item 7	-----> Count taken every shot (to FF max.)
- ② After the replacement of the Shutter, set **00** at the adjusted value display position of each item by pressing the UP or DOWN Button.
- ③ Select the item number " **0** " by pressing UP or DOWN Button while turning ON the Exposure Check Switch. And turn ON the Release Switch to write the **00** in EEPROM.

(13) Checking of Viewfinder LCD Indications

* After the repair of the camera, check the indications for broken segments. The checking procedure is as follows:

- ① After transition to adjusting mode, set the A.B.C. Lever in the " ± 1 " position and select the item number " **d** " by pressing UP or DOWN Button while turning ON the Exposure Check Switch. Then the number displayed at the adjusted value position will not always be the same, but it does not mean anything.
 - ※ Immediately before entering adjusting mode, the camera must be in the power - ON state. That is, the Back Light LED must be lighting. In the power - OFF state, the checking of the indications is impossible, since the Back Light LED remains out.
- ② Look into the viewfinder while turning ON the Release Switch, and make certain that all the viewfinder indications are lighting properly. At this point, the External LCD displays **dd** at the adjusted value position (once the Release Switch is turned ON, this display is maintained).
 - ※ All the viewfinder LCD indications are lighting as long as the Release Switch is kept ON and go out when the Release Switch is turned OFF (Back Light LED remains lighting).

C - 8. OTHERS**C - 8 - 1. Curtain Travel Speed**

- * The curtain travel speed can not be adjusted. Therefore, replace the Shutter Unit if the travel speed of each curtain is significantly different from the specified value.
- * The travel speeds of the first curtain and second curtain are both such that each curtain takes about 5.30 ms to travel the vertical length of 21 mm.

C - 8 - 2. Synchro Contact**① Delay time**

Sensing point of Shutter Tester: 21 mm
Measure at shutter time X

A range: 0.2 ~ 1.0 ms
C range: 1.7 ms or above

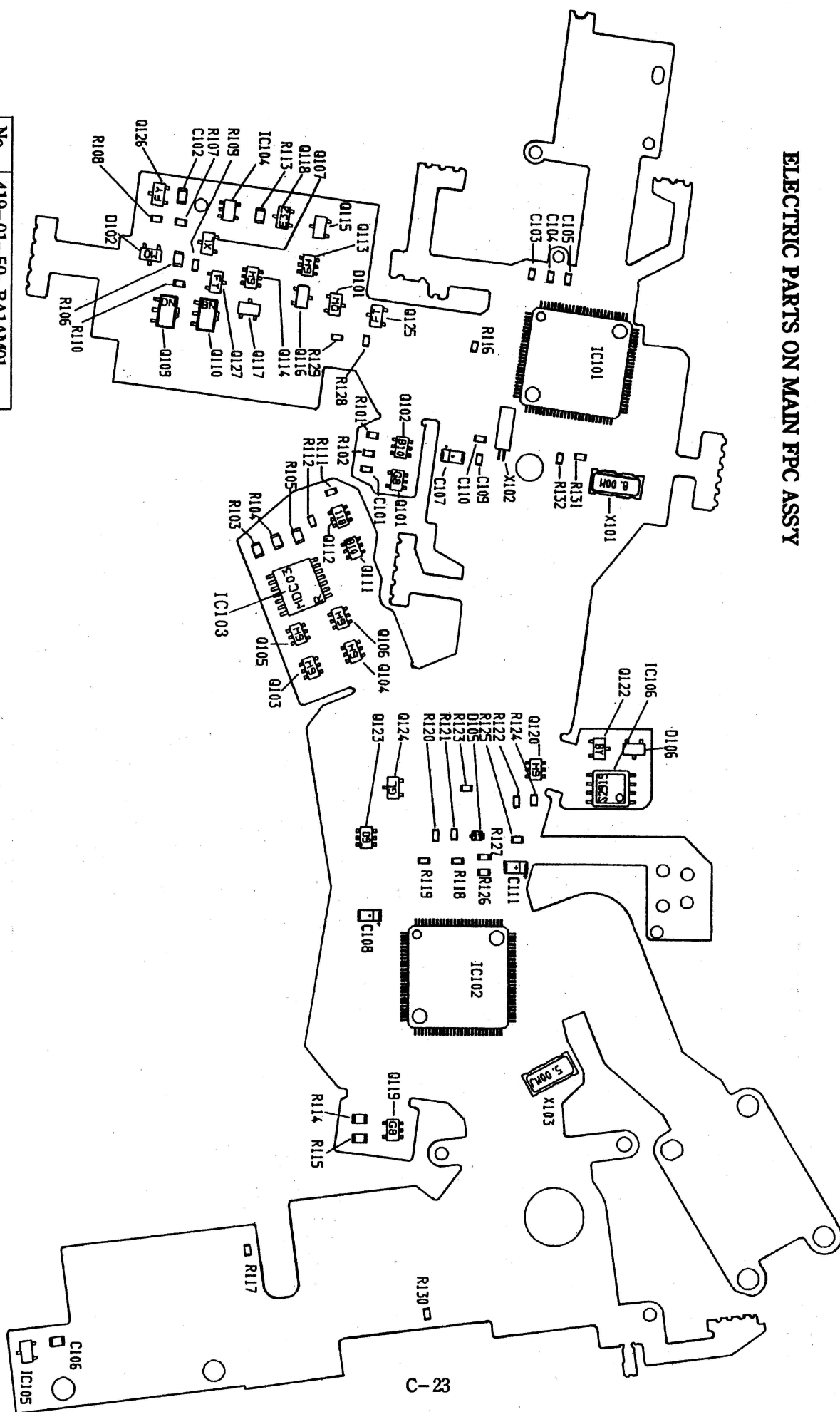
② Contact efficiency

The contact efficiency must be 60% or above at shutter speed of 1/125 sec. (X) or less.
(Use a contact efficiency tester at 1 ms.)

C - 8 - 3. Current Consumption

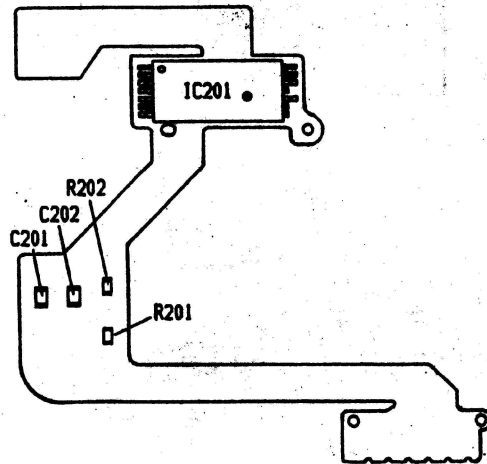
Main Switch OFF (standby current)	20 μ A or below
Power ON	
LCD ON	100 mA or below
LCD OFF	25 μ A or below
Winding operation	800 mA or below (Check with film in)
Winding stop current	2000 mA or below (Check with film in)
Rewinding operation	500 mA or below (Check with film in)
Release (shutter operation, single)	600 mA or below (Check with film in)

ELECTRIC PARTS ON MAIN FPC ASSY

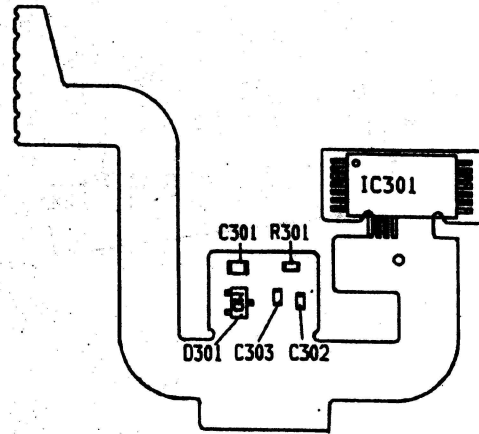


No. 419-01-50-RA1AM01

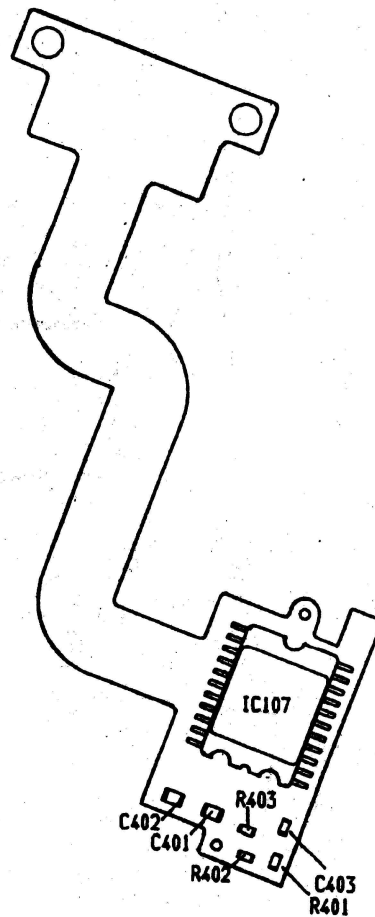
ELECTRIC PARTS ON LIGHT METERING FPC



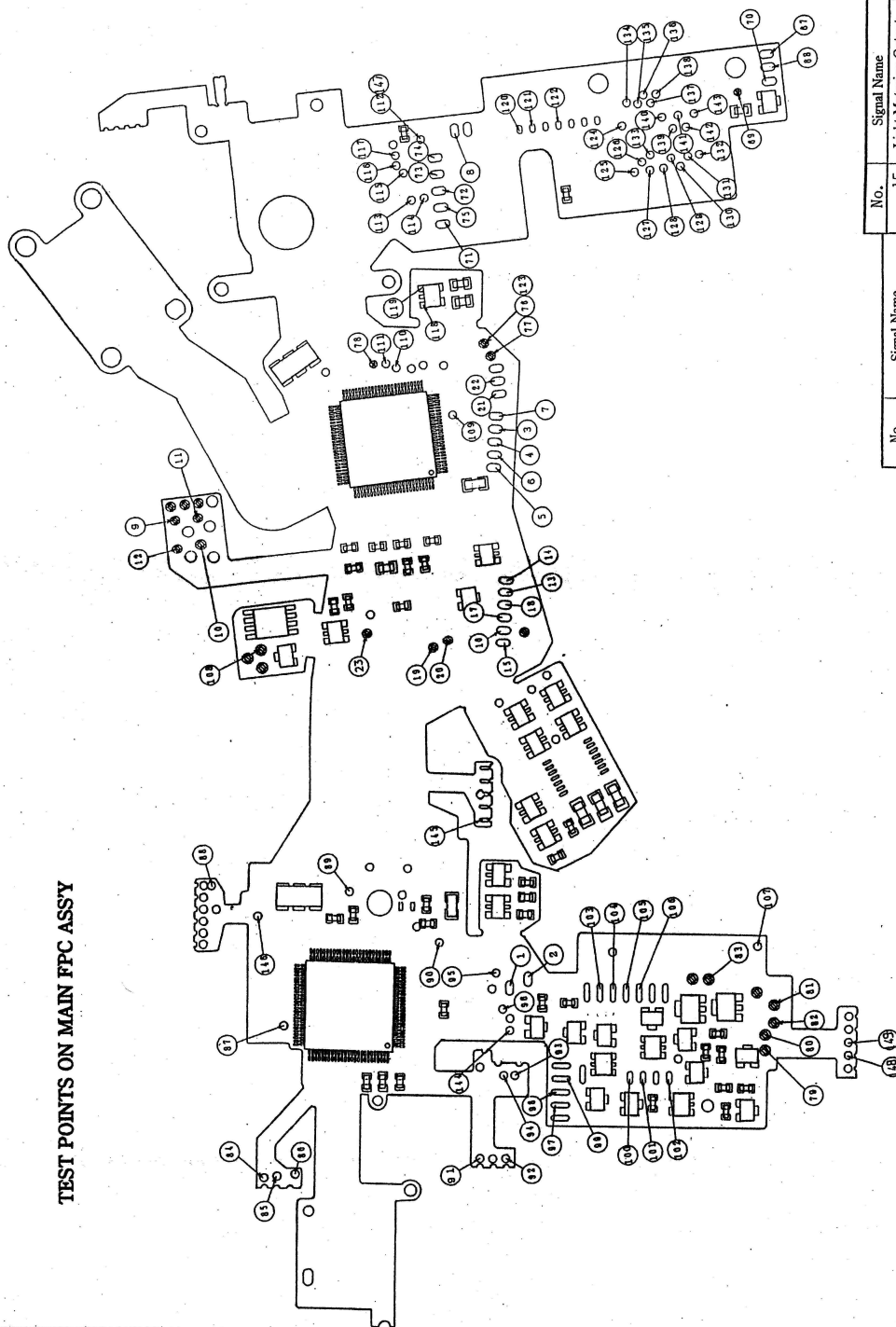
ELECTRIC PARTS ON TTL FLASH AUTO CONTROL FPC



ELECTRIC PARTS ON AF - FPC



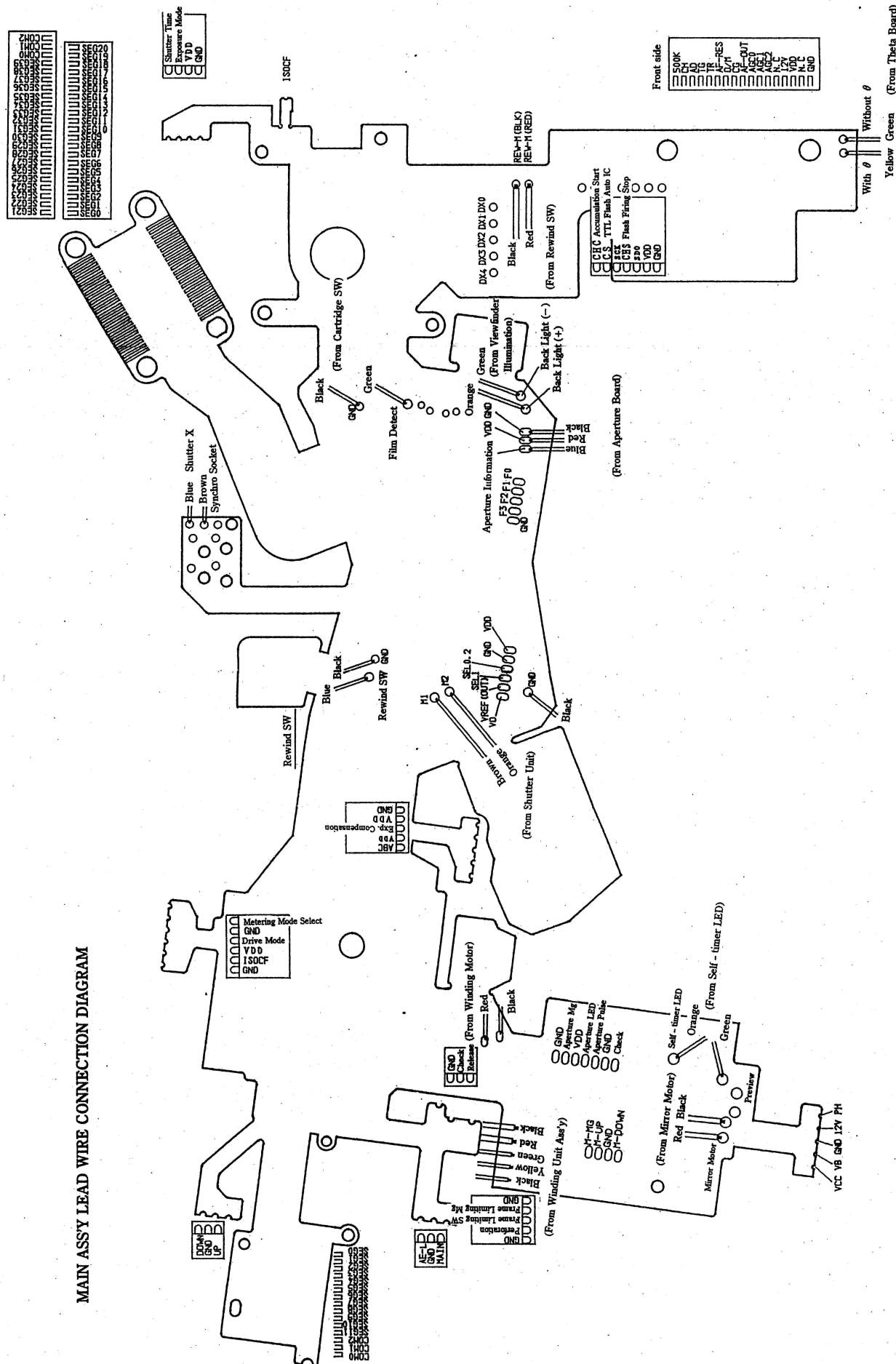
TEST POINTS ON MAIN FPC ASSY



No.	Signal Name	No.	Signal Name
30	Exp. Compensation	90	Main SW
31	AE Lock	91	Release
32	Check	92	B.C
33	VCC	93	Perforation SW
34	B.C	94	Frame Limiting SW
35	Perforation SW	95	Frame Limiting Mg (+)
36	Frame Limiting SW	96	Mirror Mg (+)
37	Frame Limiting Mg (+)	97	Mirror - up SW
38	Mirror Mg (+)	98	Mirror - down SW
39	Mirror - up SW	99	F-Mg
40	Mirror - down SW	100	VDD
41	F-Mg	101	Aperture LED
42	VDD	102	Aperture Pulse
43	Aperture LED	103	PH(DC/DC)
44	Aperture Pulse	104	CS (EPR)
45	PH(DC/DC)	105	REQ
46	CS (EPR)	106	Shutter Time Setting
47	REQ	107	Exposure Mode
48	Shutter Time Setting	108	Mode Selector SW
49	Exposure Mode	109	500K
50	Mode Selector SW	110	CH
51	500K	111	SDI (A)
52	CH	112	SDO (A)
53	SDI (A)	113	SDI (A)
54	SDO (A)	114	Back Light (L)
55	SDI (A)	115	Back Light (H)
56	SDO (A)	116	CHC
57	SDI (A)	117	CS (TTL Flash Auto IC)
58	SDO (A)	118	CHS
59	Back Light (L)	119	Back Light LED (-)
60	Back Light (H)	120	DB-PRN (DB)
61	CHC	121	Back Cover SW
62	CS (TTL Flash Auto IC)	122	DB, Lamp
63	CHS	123	ACK (Adjusting Tool)
64	Back Light LED (-)	124	M/A
65	DB-PRN (DB)	125	TEST
66	Back Cover SW	126	C/D
67	DB, Lamp	127	SDI (A)
68	ACK (Adjusting Tool)	128	12V
69	M/A	129	REQ (Adjusting Tool)
70	TEST	130	AD
71	C/D	131	AD
72	SDI (A)	132	TG
73	12V	133	TR
74	REQ (Adjusting Tool)	134	RES (AFIC)
75	AD	135	OM Select
76	AD	136	AF-OUT
77	TG	137	CG
78	TR	138	AGC0
79	RES (AFIC)	139	AGC1
80	OM Select	140	AGC2
81	AF-OUT	141	VL1
82	CG	142	ABC
83	AGC0	143	VREF (A)
84	AGC1	144	150CF
85	AGC2	145	VB
86	VL1	146	GND
87	ABC	147	
88	VREF (A)	148	
89	150CF	149	
90	VB		
91	GND		
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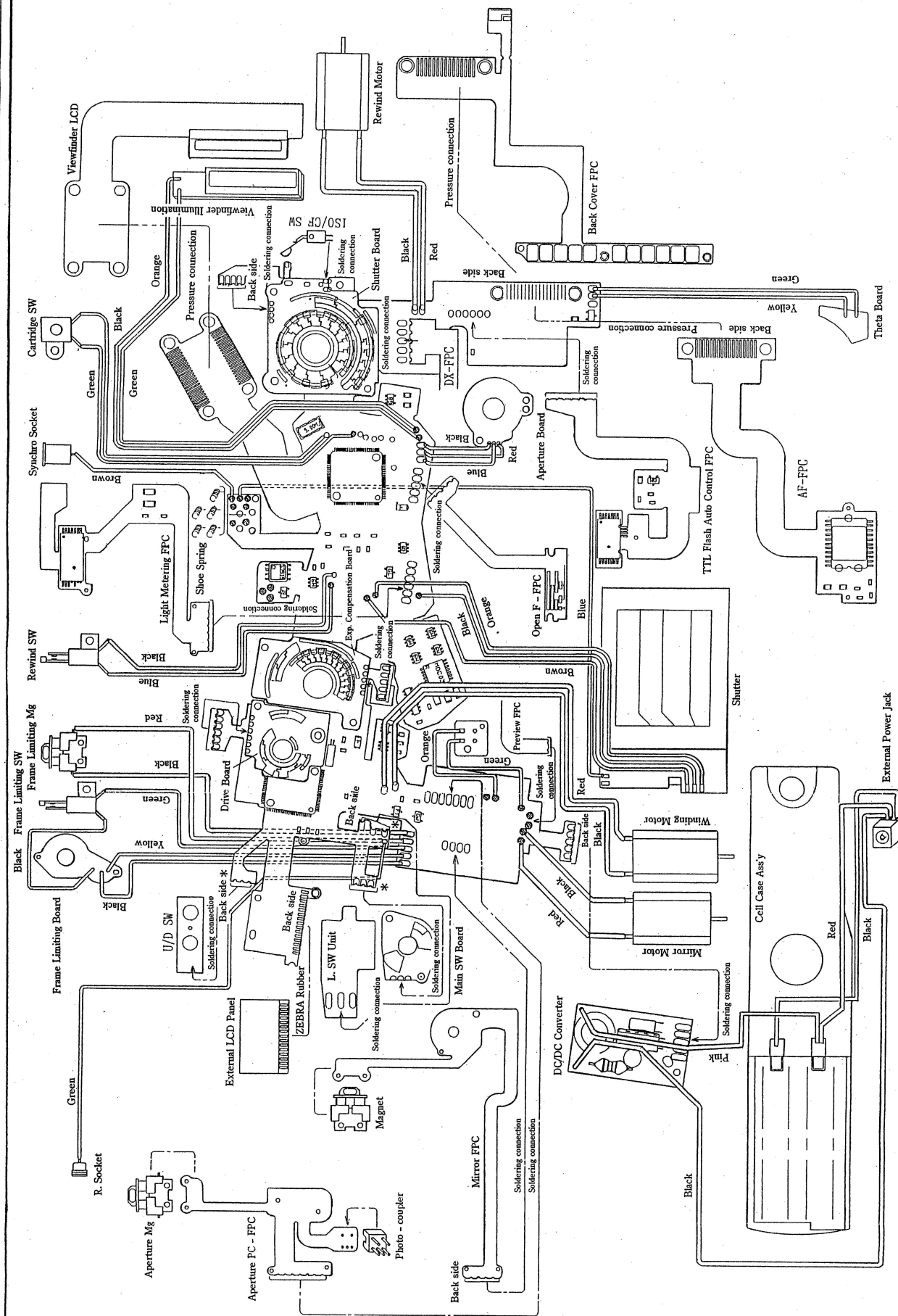
No.	Signal Name	No.	Signal Name
1	Winding Motor (+)	15	Light Metering Output
2	Winding Motor (-)	16	VREF (IC Output)
3	Open F Code/F1	17	SEL1
4	F2	18	SEL0, 2
5	GND	19	Shutter M1
6	F3	20	Shutter M2
7	F0	21	Aperture Setting
8	Rewind Motor (-)	22	VDD
9	AX (EXT)	23	Rewind SW
10	SCX (B)	24	CPUB SEG 4
11	SDA (B)	25	5
12	CH (EXT)	26	12
13	GND	27	1
14	VDD	28	20
		29	17

MAIN ASS'Y LEAD WIRE CONNECTION DIAGRAM



WIRING DIAGRAM

C-27



- Notes: 1. The electric parts on the Light Metering FPC and TTL Flash Auto Control FPC are installed on the back side in this drawing.
2. The soldering connection marked with "*" is performed with the arrangement opposite to that in the drawing (upside down or left and right inverted).
3. The soldering connection marked with "Back side" is performed on the back side in the drawing.